

REMARKS

Claims 1-11 are pending in the application. New claim 11 has been added.

I. Preliminary Matters

The Examiner has not acknowledged Applicant's claim for foreign priority.

Accordingly, Applicant respectfully requests the Examiner to mark the appropriate boxes on the Office Action Summary sheet in a subsequent Office Action.

II. Rejection under 35 U.S.C. § 102(b)

Claims 1-6 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S.P. No. 4,941,447 to Mannhardt. Applicants traverse the rejection as follows.

A. Claim 1

Claim 1 recites "a valve port provided in a channel...wherein the valve port consists of a plurality of through holes annularly disposed in a diaphragm blocking up the halfway portion of the channel".

The Examiner alleges that Mannhardt discloses a valve port (surrounding a valve seat member 16 in Fig. 1), a channel (fuel chamber 12) and a plurality of through holes (bores 18), but fails to show that Mannhardt discloses a plurality of through holes annularly disposed in a diaphragm blocking up the halfway portion of the channel. Figure 1 of Mannhardt clearly shows that the alleged diaphragm merely blocks the bottom portion of the channel where the alleged diaphragm abuts the alleged output port (mixing chambers 20). Therefore, volatilized gas is prevented from passing into the mixing chambers 20 when the valve is in a closed state.

Mannhardt, however, fails to disclose a diaphragm blocking up the halfway portion of the channel, as required by claim 1. Thus, Mannhardt fails to disclose all the elements of claim 1. In the present invention, since the diaphragm blocks up the halfway portion of the channel, volatilized gas is prevented from passing into the channel.

Applicants respectfully submit that claim 1 is patentable for at least the above reasons.

B. Claim 2

Claim 2 contains features that are similar to the features recited in claim 1. Therefore, Applicants submit that claim 2 is patentable for analogous reasons presented above in conjunction with claim 1.

C. Claim 3

Claim 3 contains features that are similar to the features recited in claim 1. Therefore, Applicants submit that claim 3 is patentable for analogous reasons presented above in conjunction with claim 1.

In addition, claim 3 recites “the channel is provided in one housing divided body of a housing that can be divided into two bodies, and is equipped with the valve port; and the other housing divided body is equipped with the electromagnetic coil, the fixed iron core, and the valve disk consisting of the moving iron core.” In other words, a channel having a valve port is provided in one housing divided body and an electromagnetic coil, a fixed iron core, and a valve disk consisting of a moving iron core is provided in another housing divided body.

The Examiner alleges that Mannhardt discloses one housing divided body (near solenoid coil 34) and another housing divided body (near fuel inlet passage 13). Figure 1 of Mannhardt, in view of the Examiners assertion, however, merely shows a solenoid coil 34 (the alleged electromagnetic coil) and a fixed iron core in the alleged first housing divided body (near solenoid coil 34), an area surrounding valve seat member 16 (the alleged valve port), a fuel chamber (the alleged channel), a flange 28 (the alleged valve disk) in the alleged second housing dividing body, and a valve poppet member 26 (the alleged moving iron core) bridging both housing dividing bodies. Applicant submits that Mannhardt fails to disclose a channel being provided in one housing divided body of a housing that can be divided into two bodies, and is equipped with the valve port; and another housing divided body equipped with the electromagnetic coil, the fixed iron core, and the valve disk consisting of the moving iron core, as required by claim 3.

Applicants respectfully submit that claim 3 is patentable for at least the above reasons.

D. Claim 4

Since claim 4 depends on claim 1, Applicants submit that claim 4 is patentable at least by virtue of its dependency.

E. Claim 5

Since claim 5 depends on claim 1, Applicants submit that claim 5 is patentable at least by virtue of it's dependency.

In addition, claim 5 recites “an inner-and-outer double-structured annular rib serving as a valve seat is provided in the diaphragm and the valve port is provided between the inner and outer ribs constituting the inner-and-outer double-structured annular rib”.

The Examiner alleges that Mannhardt discloses an inner rib (one of seat surface 36) and an outer rib (another of seat surface 36). Figure 2 of Mannhardt, however, merely shows annular sealing surfaces 40 maintained in an unrecessed state around each opening of the bores 18 (col. 4, lines 11-13). Each annular sealing surface is shown to be a single structured surface portion of the seat surface 36 that surrounds each bore 18 separately. In contrast, claim 5 requires the valve port, which consists of a plurality of through holes, to be provided between the inner rib and the outer rib which constitute the inner-and-outer double-structured annular rib. Therefore, the inner-and-outer double-structured annular rib has two structures, which are circumferentially continuous and lie between the plurality of through holes. Applicant submits that Mannhardt fails to disclose an inner-and-outer double-structured annular rib serving as a valve seat is provided in the diaphragm and the valve port is provided between the inner and outer ribs constituting the inner-and-outer double-structured annular rib, as required by claim 5.

Applicants respectfully submit that claim 5 is patentable for at least the above reasons.

F. Claim 6

Since claim 6 depends on claim 2, Applicants submit that claim 6 is patentable at least by virtue of it's dependency.

In addition, claim 6 recites “the top wall of the cylinder-shaped valve disk is bored to form an vent hole; an auxiliary channel is formed between the inner-peripheral face of the cylinder-shaped valve disk and the outer-peripheral face of the guide boss; and thereby, part of the fluid, which flowed from the output port, does not flow into the valve port when the valve is opened, but flows down along the periphery of the cylinder-shaped valve disk, and flows through the auxiliary channel from the vent hole; after that the part of fluid being capable of flowing into the valve port.”

The Examiner alleges that the above features are disclosed by Mannhardt. In particular, the Examiner alleges that the flange 28 (the alleged valve disk) is bored at it's top wall to form a vent hole. Figure 1 of Mannhardt shows a cross sectional view of the valve and also shows flange 28 extending from the valve poppet member 26 (the alleged moving iron core). The Examiner seems to contend that since the valve poppet member 26 is shown with an open top wall that Mannhardt discloses the vent hole of claim 6. The alleged open top wall of the valve poppet member 26, however, is merely shown for illustrative purposes of the cross sectional view of Figure 1, to show that the valve poppet member is hollow and slides up and down center post 24. Mannhardt fails to teach or suggest a vent hole as required by claim 6 or that the open top wall shown in Figure 1 is more than a mere cross sectional illustration of the elements interacting with one another.

The Examiner also alleges that Figure 1 of Mannhardt discloses the claimed auxiliary channel. Figure 1 of Mannhardt, however, fails to show a channel formed between the inner surface of the valve poppet member 26 (the alleged valve disk consisting of the moving iron

core) and the outer surface of the center post 24 (the alleged guide boss), thereby part of the fluid flows down along the periphery of the cylinder-shaped valve disk, and flows through the auxiliary channel from the vent hole, as required by claim 6. Thus, Mannhardt fails to disclose all the elements of claim 6 for these additional reasons.

Applicants respectfully submit that claim 6 is patentable for at least the above reasons.

II. Rejection under 35 U.S.C. § 103(a)

Claims 7 and 8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S.P. No. 4,941,447 to Mannhardt in view of 6,935,612 to McCombs et al. (“McCombs”).

Applicants submit that McCombs, alone or in combination with Mannhardt, does not correct the deficiencies of Mannhardt in regard to claims 1 and 6. Since claims 7 and 8 are dependent upon claim 6, respectfully, Applicants submit that claims 7 and 8 are patentable at least by virtue of their dependency.

Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S.P. No. 4,941,447 to Mannhardt in view of 4,621,788 to Delew et al. (“Delew”).

Applicants submit that Delew, alone or in combination with Mannhardt, does not correct the deficiencies of Mannhardt in regard to claim 3. Since claim 9 is dependent upon claim 3, Applicants submit that claim 9 is patentable at least by virtue of its dependency.

Claim 10 is rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S.P. No. 4,941,447 to Mannhardt in view of 6,564,782 to Fujimoto et al. (“Fujimoto”).

Applicants submit that Fujimoto, alone or in combination with Mannhardt, does not correct the deficiencies of Mannhardt in regard to claim 1. Since claim 10 is dependent upon claim 1, Applicants submit that claim 10 is patentable at least by virtue of its dependency.

III. Newly added claim

Applicant has added new claim 11. Applicant submits that the prior art does not suggest an inner rib and an outer rib constituting an inner-and-outer double-structured annular rib are circumferentially continuous.

IV. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. .

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23373
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Date: January 25, 2007